The correspondence between the Mason-Quimby line and the faunal extinction boundary has been cited as evidence that early man was responsible for the extinctions of these animals; see Martin (1967). However, as was argued in Section 10.1, it is difficult to attribute this global extinction episode to human hunting activities. The lack of fluted projectile points to the north could simply reflect the fact that after the extinction episode there were few animals left to hunt, and perhaps few hunters left to hunt them. Howorth (1887, Ch. 9 and 11) for example, presents considerable evidence suggesting that paleolithic man perished in the same cataclysmic plight as his animal contemporaries.

The same correlation technique that is proposed here for limiting the age of the mastodon remains in Michigan may be used in New York State with similar results. For example, a map of mastodon deposits for the eastern part of North America constructed by Dreimanis (1968) shows that in eastern New York mastodon deposits are found only in the lower portion of the Hudson River Valley. The deposits appear to terminate suddenly in the Orange County area near Albany. The ice sheet had receded to about this point by the time of the Luzerne readvance dated at about 13,200 C-14 years BP (14,700 calendar years BP).

[UPDATE: This ice margin date precedes by 1200 to 1500 years the calendar date of the peak in the megafaunal remains histogram shown in Figure 10-A and precedes by almost 2000 years the time of the final demise of the Pleistocene mammals. So this earlier flood-related demise may have been local to these regions. The animals apparently continued to survive until a subsequent tragedy finally extinguished them around 12,700 years BP. The existence of the Mason-Quimby line would suggest that these fluted projectile points are not contemporaneous with Paleo-Indian sites that have been dated to around 12,400 – 13,000 calendar yrs BP. Or, if they are, then some barrier other than the ice sheet margin, such as a northward extending proglacial lake, would have had to be present to account for the absence of artifacts and mastodon remains further north.**]**

In light of the material presented in Section 9.3, it may be argued that the extinction of the mammoths and other fauna found in association with them, and the deposition of the drift in which they are found, may be linked in common to the passage of one or a series of glacier waves. These waves would have reached their peak severity about 14,100±100 calendar years BP in connection with a period of unusual climatic warmth during which time the continental ice sheets in all parts of the world were melting at an unusually high rate, [a briefer, more lethal episode occurring around 12,700 years BP.] It may be argued that associated harsh environmental conditions were also a major cause of death; e.g., high temperatures prevailing in low latitude regions. It is suggested that this climatic warming was brought about by the injection of nebular material into the solar system during the passage of the 14,200 years BP superwave. Energetic solar activity may also have been a contributing factor, e.g., see Subsection 4.7.3. Future determinations of C-14, Be-10, and cosmic dust concentrations in ice cores spanning this period should confirm this hypothesis.

UPDATE

The Detection of a Radiocarbon Anomaly at the Younger Dryas Boundary (update for **p. 141** and **p. 283**): I had suggested in section 10.4 that the anomalously young radiocarbon dates found in some megafaunal remains may have been produced by exposure of these animals to intense solar cosmic ray bombardment. Such a scenario looked plausible in view of the lunar rock evidence which indicated that solar activity was significantly enhanced at the end of the ice age. The same immense coronal mass ejection event that scorched the moon rocks could have overpowered the Earth's magnetic field and exposed the Earth's surface to

for example, argues that many radiocarbon dates assigned to the remains of Pleistocene megafauna should not be trusted. He cites the problematically young date of 2,040 ± 90 C-14 years BP found for the terminal Pleistocene deposits in St. Petersburg, Florida and also questions the youth of several mastodon remains found in Michigan and dated at around 6000 C-14 years BP. Because of these few dates, which are in obvious error, he warns that all C-14 dates of mastodon remains may be in error to some degree. He states (p. 98):

> Is it possible that all postglacial dates on mastodons are overshots? No skeptical archaeologist would consider accepting a radiocarbon date of 6,000 to 8,000 years on an alleged Clovis site before subjecting it to the most minute excavation and examination, without demanding an effort at replication of the date on the critical beds, without considering carefully all the possibilities of intrusion, and without a field demonstration of the evidence to equally critical colleagues.

Variability in radiocarbon dates is also encountered in remains unearthed from the permafrost muck layer in Alaska and Siberia. In Alaska, dates on remains from essentially the same muck layer have been found to range from ~200 C-14 years BP for mammoth-bearing deposits from Sullivan Creek (Martin, 1967, p. 93) to <30,000 C-14 years BP for similar deposits near Fairbanks (Broecker, Kulp, and Tucek, 1956). In Siberia, dates on wood and animal remains from the mammoth horizon have ranged from 11,500 C-14 years BP (Taimyr Peninsula) to 30,000 C-14 years BP (Lena River); see Martin (1967). However, it would be incorrect to interpret this wide range of dates as being indicative of the span of time during which this silt layer was being deposited. As was pointed out in Section 10.2, there is substantial evidence to indicate that the mammoth horizon in Northern Siberia and the Late Wisconsin Goldstream Formation in Alaska were deposited in a short space of time by a flood (or by floods) of water.

[UPDATE: Radiocarbon dating of these strata indicates that they were both deposited around 11,000 C-14 years BP (12,700 calendar years BP), the time of the final disappearance of the Pleistocene megafauna. Several studies indicate the presence of a radiocarbon anomaly at this date (see update at the end of this chapter). Also, North Atlantic ocean core data shows that the abundance of lithic grains transported from the continent by glacial meltwater outflow began increasing around this date to culminate in the latter portion of the Younger Dryas in what has been designated as Heinrich Event 0. For more about Heinrich events see the update at the end of this chapter (**p. 291**).**]**

Unusually young radiocarbon dates may be accounted for within the context of the Galactic Explosion Hypothesis. For example, in Section 7.2 (**p. 212**) it is suggested that a period of unusually intense solar flare activity (or a T Tauri-like solar outburst) may have been involved in simultaneously producing the Gothenburg Geomagnetic Excursion and in clearing out dust from the inner portion of the solar system; also recall Figure 4.5 (**p. 142**). If so, such an event could temporarily have produced very high solar cosmic ray intensities which in turn would have produced abnormally high levels of C-14 in the atmosphere. Also, excess C-14 may also have been produced within the animal remains through the capture of secondary neutrons by nitrogen nuclei present in protein tissue such as collagen. Future measurements of C-14 and Be-10 in glacial ice dating from this period should help to determine if such an event actually occurred. If it did, then C-14 dates on organic matter deposited at this time should be mistrusted.

Schove (1977) warns, in agreement with the above conclusion, that C-14 dates from the mid-Bölling/Ågård Interstadial (~14,100 ± 100 calendar years BP) may be abnormally young. He notes that a geomagnetic excursion occurred about this time (i.e., the Gothenburg Excursion) and that during this time the Earth's magnetic field may have been abnormally